

# CICADA BUZZ

Tina Allen (front left) and the Darwin CICADA Group



Darwin Cicada Dinner



Rafael Villamer

## Cochlear Implants for Darwin

From Tina Allen Medical Writer and Editor

I spent five days in Darwin (11–16 October) interviewing health professionals and two people who had previously been implanted by Professor Gibson in Sydney: Chris Blackham-Davison and Rafael (Raf) Villamer, a 12-year-old boy from the Philippines. I was interested to see the way the Sydney Cochlear Implant Centre (SCIC) is providing Outreach Services to people needing a cochlear implant in the Northern Territory (NT).

On my first night in Darwin, Chris Blackham-Davison and his Lions hearing dog, 'Ivy' took me to Stokes Hill Wharf, a dining precinct on Darwin's Harbour. Chris had advertised the event on the CICADA NT Facebook page, but wasn't sure if many people would turn up, so we were both delighted when 13 came to the dinner. Chris set up the CICADA banner and we purchased our meals with an Asian flavour from take-away outlets along the wharf. If you have seen the movie *Australia*, this is the same wharf where cattle ran up the ramp to be loaded onto ships. Chris was a volunteer bus driver during filming in 2007 and also met the director, Baz Luhrmann.

Some of the people who attended the dinner were cochlear implants recipients while

others were young deaf people seeking a social outlet with others who could sign. I wasn't expecting to meet Raf and his family until they next day, so it was a bonus when they also turned up to the dinner.

One of Raf's teachers of the deaf, who came to the wharf that night, told me that the chronic middle ear infection, otitis media is still a big problem among Aboriginal children in the NT, affecting approximately 50 percent of children attending schools in Darwin and 80 per cent of children living in remote communities. Approximately 35 people in the NT have a cochlear implant, including one young Aboriginal man. These figures are likely to rise as a cochlear implant program becomes established in the NT.

Professor Bill Gibson and Dr Halit Sanli came to Darwin to assist Dr Hemi Patel and Dr Graeme Crossland with surgeries on Monday 14 and Tuesday 15 October. In May this year Professor Gibson performed the first cochlear implant surgeries in the Territory in conjunction with the NT surgeons; however this time the NT surgeons were performing the surgeries. Halit was also in the theatres of the Royal Darwin Hospital teaching a local audiologist

the intra-operative testing procedures, which ensure the implant is functioning correctly before the surgery is completed.

Raf Villamer travelled to Sydney for his first implant in 2010, but was having his second implant in Darwin on the Monday during my visit. Being able to have both his implant and habilitation in Darwin is a big step forward for hearing impaired people in the NT such as Raf. On the last night, Prof, Halit and I were taken out for dinner by the surgical team to an upmarket restaurant further along the waterfront from Stokes Hill Wharf.

Professor Gibson visited Darwin in 1983 not long after his move to Australia and appointment as the first Chair of Otolaryngology at the University of Sydney. He was invited by an ENT surgeon from Sydney Hospital, Dr Victor Bear who thought it would be a good experience for an English surgeon to treat the ears of Aboriginal children and adults on Bathurst Island. Thirty years later, when he is planning for his retirement, it is poignant that Professor Gibson is once again making a positive contribution to the hearing of people in the NT.

# State CICADA Associations

## New South Wales

CICADA AUSTRALIA INC.

Secretary: Judy Cassell  
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## Queensland

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## Western Australia

CICADA CLUB W.A. INC.

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## Northern Territory

CICADA Darwin

Coordinator Chris Blackham-Davison  
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## ACT

CICADA ACT INC

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## Hook Up Online And Share Your News

Please visit us at [www.cidada.org.au](http://www.cidada.org.au)

Or our Facebook page Cicada Australia Inc.  
Darwin friends now have their own Facebook page Cicada Northern Territory

If you would prefer to receive this newsletter by email, please send your details to [suewalters@cidada.org.au](mailto:suewalters@cidada.org.au)

Donations over \$2 to CICADA are tax-deductible.

CICADA Australia Inc. thanks Cochlear Ltd. for supporting the design, printing and distribution of this newsletter.



## From the President

President's Report from the AGM  
November 2013



Illawarra Group members Amelie, David, Felix and Jo at the Illawarra Live Steamers

Welcome to you all on behalf of the CICADA Committee. I hope you have enjoyed being a part of our CICADA gatherings this year. If you are a newcomer today, please don't be shy. We have a saying here "There are no strangers at CICADA, only friends we haven't met yet." Our gatherings are a great opportunity to ask others what it is like to hear with a cochlear implant and manage it day to day. I see this as the main role for CICADA- to inform people in an unbiased way, so they can weigh it up with information they receive from professionals in the field.

We have several CICADA groups in NSW now. Bob Ross has built strong friendships amongst his group who meet regularly for BBQ days at picturesque seaside locations in the Illawarra region. They also visit the Illawarra Live Steamers where the children (and big kids too) can enjoy the large-scale model trains. Definitely a great day out. My congratulations to Bob and his team of committed helpers.

The Western Sydney group holds BBQ days at Nurragingy Reserve Blacktown throughout the year and in May held the first Penrith Morning Tea at the newly opened Penrith SCIC. These morning teas continue monthly and I thank Rhonda Greene, Geoff Letford, Sean Sewell and Judy Tutty for their kind hospitality to guests who attend.

We have Karen Dempsey and Maryann McKenzie helping people in Newcastle, Xanthe Mclean in Orange District and Vivien Cooper with her Barefoot Bowls gatherings in Gosford. These people are all making it happen and I appreciate their efforts.

Our CICADA website is slowly taking shape. Our Webmistress, Pat Mitchell, has been making changes and encourages us to provide her with material to keep it fresh and interesting. We would love contributions from CICADA members- share your personal stories and photographs - interesting stories related to deafness or implants that you find that could be shared with others.

The Calendar on the website is now being well used by groups across Australia to advertise their gatherings, so this information can now be accessed by everyone and we can see that there is quite a bit happening. It

Hearing Solutions" which has been posted on the website and available for downloading. It was reviewed by several hearing professionals and has received very good feedback. Some teachers have commented that it is a good resource for their students. In September, the Guide was downloaded from the website 55 times, so it is good to see results from Nev's hard work in bringing all this information together in one place.

CICADA is a member of the Deafness Forum, the peak National body for hearing issues that advises government. This year they made several representations to government on the Disability Care Program to raise awareness of issues that need to be addressed on behalf of hearing impaired and deaf Australians.

In August, ACCAN, the Australian Communications Consumer Action Network held a conference at Technology Park in Sydney entitled "M-enabling Australasia 2013" which was the first of its kind in the southern hemisphere. The idea was to discuss mobile technology as a great enabler for people with disabilities and senior Australians and how to make technology more accessible to these consumer groups. It brought together developers, manufacturers, telcos and government representatives to listen to community advocates (physically, vision and hearing impaired) clearly voicing their views on what still needs to be done. The main message was that ACCESSIBILITY needs to be built in to mobile devices and technology from the start, not just as an add-on or an afterthought and it needs to be affordable. Telstra, one of the major sponsors of the event, have a very good record for providing disability services. Overall the conference was a great learning opportunity. There is a lot of collaboration and it IS producing results in this field. There are many people advocating for the hearing impaired to keep improving access to technology and captioning.

Other significant events this year were the opening of the Australian Hearing Hub at Macquarie University, the Governor Marie Bashir opening the Penrith branch of SCIC to allow easier access for services to Western

# Research at SCIC; “We Want YOU”

Guest Speakers at the November AGM



Guest speakers, Isabelle Boisvert and Leanne Babic

SCIC is involved in many and varied research projects in collaboration with other organisations. This research is extremely important for improving many aspects of the CI program and the benefits flow on to current and future generations of recipients. We are blessed to have dedicated people to do this exciting work.

CICADA sincerely thanks **Leanne Babic** and **Isabelle Boisvert** who presented on some of their work at our AGM. We also met **Valerie Looi**, who is the new SCIC Research Manager, coordinating projects, researchers and helping to get the information out to conferences and journal articles across the world.

**Leanne Babic** has recently conducted research in Single sided deafness, where CI's have been used in conjunction with normal hearing in the opposite ear. As the brain is designed to hear naturally with 2 ears, 3 main benefits are observed. Normal hearing people can localise sound in their environment, they can hear better in noise by attending to the ear that is getting a better signal-to-noise ratio (SNR) and another benefit known as “binaural squelch” occurs. This is where the auditory system can combine the signals available to each cochlea to produce an internal, central representation of the speech with a better SNR than is available at each ear individually. The way the brain does this is complex, and still partly unknown, but it is believed that the brain compares the noise at

each ear and extracts the speech signal from the noise signal. Preliminary data from this study showed that after 6 months use of a CI in the previously deaf ear, clients showed a significant benefit hearing in noise and could localise sound to some degree.

Leanne has enlisted participants for a telephone study for recipients over 18 who have had a CI for at least 6 months. A minimum of 50 clients was required to investigate the issues and difficulties of telephone use and how it can be improved. A CI recipient can typically access sounds from 150-8000Hz, but a telephone signal is a “band-limited” signal ranging from 300-3400 Hz. The restricted telephone signal means that their understanding of speech is compromised when listening on the phone.

There is recent evidence that online “brain-training” programs can improve the perception of speech in noisy environments for elderly adults with normal hearing. Leanne will be conducting a study on recipients over 60 with at least 18 months CI experience. You must be able to use a computer and login daily for one hour over a 3 month period (40 hours training!). To volunteer, contact Leanne at SCIC Gladesville.

**Isabelle Boisvert** recently completed her PhD with research in outcomes for CI recipients with a “long term deaf” ear, having different levels of hearing in their other ear. She discussed how “cognition” links to

outcomes with the implants. It is important not to confuse “cognition” with “intelligence” – because this can lead to people feeling they are not intelligent enough to hear with a CI – and this is completely wrong! Isabelle explains: “When I talk about cognition, I refer to the way our brain processes sounds. Without cognition (such as knowledge of language, attention, effort, filling in the gaps when parts of the message were not heard), everything we would hear would be meaningless – just a series of melodic sounds. Some people are good at learning a new language or playing with words, while others are good at maths and others with arts – and this is not general intelligence, but some things we are simply better at. What I mean with cognition for my studies is how people make words and sentences from the sound they hear, in particular when the sounds are degraded.”

Isabelle is currently recruiting CI recipients to help with research projects looking at improving the test battery that is used to measure performance with the CI. If you want to volunteer, you can contact Isabelle at [research@scic.org.au](mailto:research@scic.org.au).

“When I talk about cognition, I refer to the way our brain processes sounds. Without cognition...everything we would hear would be meaningless – just a series of melodic sounds.”

## SCIC needs you!

There are still many things to learn about cochlear implantation and this is why SCIC is involved in multiple research projects. The new knowledge helps us continuously improve services to our clients. But to do this research, we need you! Research participants are essential to get a better understanding of cochlear implantation. If you want to help, send us an email with your name: [research@scic.org.au](mailto:research@scic.org.au)

# 23rd Annual General Meeting of Cicada Australia Inc.

November 2013

Another very successful AGM was held on 3rd November. Cicada's President Sue Walters welcomed those attending and following the election of office bearers, reported on the year's activities – see From the President.

## Office Bearers for 2014

President	Sue Walters
Secretary	Judy Cassell
Treasurer	Chris Boyce
Public Officer	Karen Cooper
Alan Jones	
Neville Lockhart	

A vote of thanks was given to Matt Laxton and Anne McCourt who did not stand for reelection, for their valuable contribution to Cicada.

Leanne Babic and Dr Isabelle Boisvert, Research Audiologists from SCIC were guest speakers at the AGM. They spoke of SCIC research projects they are involved in - a summary of which can be seen in this issue of the Buzz.

The Cicada annual raffle was drawn after the AGM. Congratulations to the winners.

First Prize	\$500 to the Mitchell Family, Moss Vale
Second Prize	\$200 to M & R Harding, Jamestown SA
Third Prize	\$100 to F. Logue, East Maitland

Thanks to all those who support our annual raffle and also to those who give a donation in lieu of. This ongoing support is greatly appreciated.

## Postscript

A small group of Cicada supporters have volunteered to be Social Committee members to assist with setting up and packing up after our functions. This support is greatly appreciated as not all committee members can attend all of the Cicada events and it helps to lighten the load. If you have the time and are interested in assisting at our functions, please contact Judy Cassell - [judycassell@cicada.org.au](mailto:judycassell@cicada.org.au). Your support would be greatly appreciated.

## Cicada website

Check the CALENDAR on the Cicada website regularly for upcoming social events across Australia and updates

## Governor-General of Australia Ms. Bryce Visits Sichuan University and Investigates Australia Cochlear Project in West China Hospital

Oct 2013 CHENGDU, China, PRNewswire

Executive Vice-President of Sichuan University Professor Li Hong welcomed Ms. Bryce and the delegation on behalf of the university. He gave a brief introduction on the history, size, personnel cultivation, foreign exchanges and cooperation and other aspects of university, especially the developments of West China Hospital in recent years. He hoped the visit of Ms. Bryce could further promote the exchanges and cooperation between West China Hospital and Australia in related fields, establish more high-level institutions like "West China Clinical Medical School - Australia Cochlear Research Center." Ms. Bryce expressed her gratitude for the warm reception of Sichuan University, the pleasure to visit the university of such a splendid history, and also the great admiration and congratulations for the remarkable achievements by West China medical personnel. She stressed that in the current world, the developments in the education, science and other areas could not prosper without the extensive cooperation among the countries. She hoped that China and Australia could work together not only to impel the developments of the two countries, but also to provide more positive achievements to benefit people worldwide.

Afterwards, Ms. Bryce visited the "West China Hospital, Sichuan University - Australia Cochlear Cochlea Project." The Cochlear Implant Center, which was

established through the cooperation between Cochlear company of Australia and West China Hospital, has been one of the cochlear implant centers of the "Hearing Reconstruction and Rehabilitation Program" project since 2007. Ms. Bryce also visited the Cochlear cochlea debugging equipments with the explanation by Professor Zheng Yun and the operation demonstration by the technician Mr. Tao Yong. Then, she listened to the report on this project presided over by Secretary of the hospital Ms. Jing Jing and presented by Vice-Director of the hospital Mr. Gong Qiyong. She also appreciated the drawings and the poetry reading of three kids with hearing rehabilitated after successful cochlear implantation. After the show, Ms. Bryce approached the children and gave them dolls of koalas and kangaroos representative of Australia. She said she was greatly moved by the endeavours of the research staff, the medical staff and the related workers for the hearing rehabilitation of the children. She said emotionally, "I want to express my sincere happiness and gratitude for the devotions of the researchers of both China and Australia on the investigations and practice of the project. Thanks for you all and I've spent a memorable afternoon."

# NSW Support Groups

Upcoming events in 2014 – Put these dates in your diary



## Cicada Illawarra – functions for 2014

The Cicada ILLAWARRA CI Support Group has just completed its 5th year in existence and its with great pleasure that the Coordinators can say, that everything is running smoothly, and our numbers on 'event' days are consistent. Please feel free to attend on ALL or any of the dates listed, and if you have any questions, just email Bob.

Sunday 23rd February	Shellharbour Pool
Sunday 27th April	North Wollongong
Sunday 22nd June	Towradgi Beach
Sunday 31st August	Shellharbour Pool
Sunday 26th October	North Wollongong
Sunday 7th December	Towradgi Beach Xmas Party

All events subject to weather permitting

Please contact **Bob Ross** for further information

Mobile: 0418 630 466

Email: rossybikein@gmail.com

## Central West Hearing Support Group

The Central West Hearing Support group met on Saturday 9th November 2013 to listen to a very informative update on cochlear implant and hearing aid technology and trends presented by Senior Audiologist Sarah Love, who is based at the Penrith SCIC clinic. The majority of the 10 attendees were cochlear implant recipients so it was an extremely relevant topic as many in the room still have a hearing aid on the non-implanted ear. There were some interesting discussions as usual as we compared experiences. We thank Sarah for her time and effort travelling to Orange during her own weekend time, and indulged her with a bottle of locally produced wine in the hope she will return to visit and possibly talk again in the future! The next meet up will most likely be in March this year.

Contact **Xanthe** on [x.mclean99@gmail.com](mailto:x.mclean99@gmail.com) for details

## Newcastle

MaryAnn  
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OR Mobile 0438 461 659

Karen  
[kaz\\_dempsey@hotmail.com](mailto:kaz_dempsey@hotmail.com)  
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## Western Sydney

Morning Teas - 1st Tuesdays of the month at SCIC Penrith

Suite 5a/ 119-121 Lethbridge St, Penrith from 10-30 am to 12-30

Western Sydney has a Facebook page which can be found at [Facebook.com/westsydneycicada](https://www.facebook.com/westsydneycicada) or by searching Western Sydney Cicada. Information and dates about functions can be found on this site. There is also a dedicated email address [westersydneycicada@hotmail.com](mailto:westersydneycicada@hotmail.com) if more information is required.

Sean Sewell may also be contacted on - [sewell\\_sean@hotmail.com](mailto:sewell_sean@hotmail.com)

Mobil phone SMS only - 0415205877

## Cicada-NT Group

Chris Blackham-Davison  
[Deafncrazy@gmail.com](mailto:Deafncrazy@gmail.com)

## Join our facebook page

[www.facebook.com/groups/519831404697696/](https://www.facebook.com/groups/519831404697696/)



# Dates for Cicada Functions at Gladesville 2014

All are Welcome.

## Morning Teas

Morning Teas will continue to be held on the first Thursday of the month, February to October

6th February
6th March
3rd April
1st May
5th June
3rd July
7th August,
4th September
2nd October

## BBQ's

9th March
25th May
24th August
AGM 2nd November

The guest speaker/BBQ format continues to be very popular, with our guest speakers for March Sarah Tracton and Kate Obermeyer speaking about their CI experiences. CI implant surgeon, Associate Professor Melville da Cruz will play his violin as part of the presentation. See details of the day on the inserted flyer.

Information can also be checked on the Cicada Website [www.cicada.org.au](http://www.cicada.org.au) or by contacting the secretary, **Judy Cassell** [judycassell@cicada.org.au](mailto:judycassell@cicada.org.au)

## Therapy via iPad aims to help children with cochlear implants

Dec 2013 Stanford school of medicine

Lucile Ross, 1, and her father, Lyle Ross, say goodbye to teacher Sharon Nutini of the Jean Weingarten Peninsula Oral School for the Deaf, who is onscreen.

One moment, Lucile Ross, sitting in a highchair, is happily chomping on a fistful of Cheerios. The next, she's grabbing her ear, looking up wide-eyed in surprise at the grownups in the tiny room. Lucile, 1, who is severely hearing impaired, obviously just heard something. "That was beautiful," said her hearing therapist and teacher, Sharon Nutini. "That was the response that we wanted. She immediately reached up." Soft laughter, full of joy and relief, erupted from Lucile's mother and father. The four were crowded together in a small office one day last summer, about a month after bilateral cochlear implant surgery. Her parents, Lizzie and Lyle Ross, captured the moment the implants were activated on video to share with family. But they knew it was just a first step, not an overnight cure, and that their help would be vital to their daughter's success. Lucile is one of about 17 other hearing-impaired toddlers from across Northern California to participate in a new "teletherapy" program called BabyTalk, a collaboration between the Stanford School of Medicine's Department of Otolaryngology and the Jean Weingarten Peninsula Oral School for the Deaf in Redwood City. The program is designed to teach children under the age of 3 how to use their newly implanted device regardless of where they live or whether their families can pay for the therapy. "Getting an implant is the easy part," said Nikolas Blevins, cochlear implant surgeon. Blevins is part of the BabyTalk team, which also includes an audiologist and a social worker, in addition to the teachers like Nutini from the Weingarten School.

teacher and the student and his or her family members. Participation in the program typically lasts until the child turns 3. The program includes a one-night stay for the family at the Weingarten school to personally meet the child's therapist and professional team. All services, if not otherwise covered, are provided for free through a grant from a community donor. "A deaf child who is implanted when they are really young, and who gets really good therapy, you would never know they are deaf".

Parent Support and Distance Education [www.jtc.org/services/parent-distance-education](http://www.jtc.org/services/parent-distance-education) jtc is the John Tracey Clinic in the USA; John is the deaf son of actor Spencer Tracey. Tracey supported the Shepherd Centre when it was formed in 1970 with an oral teaching philosophy.

This program provides an opportunity for parents of children ages birth to five to independently pursue language learning with their children according to their own pace and specific interests. Course materials cover exploring listening, building language, developing speech and enjoying learning. This program is offered free of charge. Mini Course: Designed for use by families in the first few years after identification of their child's hearing loss, this course summarizes initial information, provides considerations for decision making and gives suggestions on support. It has separate sections about hearing loss, communication and parent roles. Extended learning ideas help parents recognize what they know, consider how they feel and identify steps they wish to take. Baby Course: Geared toward infants and toddlers (i.e., birth to two), this course discusses early hearing loss, infant-toddler development, parent-child communication and learning through play. Suggestions are given for

## iPad Apps for People with Hearing Loss

from Geoff Plant at the Hearing Rehabilitation Foundation [www.hearf.org](http://www.hearf.org)

Geoff recommends all these apps; he says most are free and more advanced versions are only a few \$: Hear Coach: Word Target and Number Repeater; English Listening; Toeic Lite (Topics and Sentences); Story Mouse Talking Books and The Emperors New Clothes; Animal Sounds. Also mainly for children who are non-verbal or autistic: Tap to Talk; Flashcards for Kids; Things You Eat; Emotions. A separate category, Music Apps, includes: iBeat-The Metronome; Scape; Musical Instruments; Discover Musical Instruments; Orchestra. See website for details.

## Lucas wired for stereo sound

Oct 2013 The West Australian



Lucas Gallop.

Thousands of Australians are set to benefit from moves to use cochlear implant hearing devices in people who are deaf in only one ear. Until now, it was believed the devices should only be used in the most severely deaf - people unable to hear in both ears - but they have now been approved for single-sided deafness, after WA researchers helped prove their value.

Already, patients ranging from babies through to people who have been deaf in one ear for up to 30 years have been helped, allowing them to hear "in stereo". University of WA professor of otolaryngology, head and neck surgery Gunesh Rajan said "People with single-sided deafness have big communication challenges, because

they cannot follow conversations in noisy environments or localise where sounds and voices come from, so it can be extremely frustrating for them; In children, single-sided deafness has a clear impact on their social, emotional and academic development. Around 3 per cent of schoolchildren suffer from single-sided deafness.

Two-year-old Lucas Gallop is one of the first West Australians to get a cochlear implant to treat deafness in one ear. His mother Jen said the difference since the device in his right ear was switched on six months ago was remarkable. "Before, when there was a sound he would have to turn around in different directions to try to work out where it was coming from, now his hearing is sharp as a tack and he knows exactly where the sound is coming from and the clarity of his speech has really improved."

## Melbourne scientists develop free online hearing test

Nov 2013 7 News Melbourne



Internet hearing test

Melbourne scientists have created a free online test. The new web-based test that uses words, not beep tones, could help as many as four million Australians who suffer with hearing loss. Researchers say it is not only important to do the test but to do it before hearing loss becomes irreparable. That's one reason the inventors have made it available online for free. They say the high cost of traditional testing is a barrier to diagnosis. "Too few Australians are getting their hearing tested. They're put off by a stigma and inconvenience of going to see an audiologist," said Professor Peter Blamey, Chairman of Blamey Saunders Hears. "While working on the bionic ear I spent many years studying how toddlers develop speech and more recently on how many of us gradually lose

our ability to understand the spoken word. "Last year I realised that the big flaw with the traditional hearing test is that it's not directly measuring how we hear and understand speech."

## School's fund-raising initiative for hearing impaired

Sept 2013 Maitland Mercury



Hayden Moxey was part of a student project at Maitland Grossmann school to help understand what hearing-impaired students go through, and also to help raise money, with proceeds going to Cochlear. Most school-aged students endure some kind of difficulty in their lives. But for deaf and hearing impaired students, those difficulties can be harder to overcome. Prefects and members of the school's student representative council wore earmuffs for D-Day to raise awareness of hearing problems among the school community. The school has five students with varying degrees of hearing loss and all wear assistive technology to help them hear, ranging from simple hearing aids to more advanced cochlear implants. D-Day was co-ordinated by prefect Hayden who said: "Wearing the earmuffs gives the students a better understanding and perspective of how difficult it is for hearing impaired students. It's also pretty alienating in class because you couldn't participate in conversations and if you fell behind it was impossible to catch up." The school has a strong record for supporting hearing impaired students and will launch a specific hearing support class in 2014. This year four hearing impaired students from the school participated in the Hunter Signing Choir and performed at Star Struck, with students Billie Charleston and Kiana Robinson selected to take part in the Sydney Schools Spectacular.

## Music Perception for Cochlear Implant Users Aug 2013 AAMHL

Web Conference for Musicians with Hearing Loss;

By bypassing the damaged sensory hair cells in the inner ear, cochlear implants can provide people living with severe to profound hearing loss with a sense of sound. But do they bring (or bring back, for some) a sense of music? One young pianist named Holly explains her experience perceiving sound and music through her implants in this clip from the documentary *Lost and Sound*:

She can sense the difference between pitches, and hear certain pitches better than others, even though the notes seem more like vibrations than actual sounds. Music perception is so much more complex than speech perception that cochlear implant users, after implantation, often have to learn or relearn to listen to music.

Despite the challenges, plenty of cochlear implant wearers are dedicated musicians—such as Wendy Cheng (who plays viola) and other members of the Association of Adult Musicians with Hearing Loss (AAMHL), which she founded. A web conference was recently organized by AAMHL titled *Learning and Making Music with a Hearing Loss: Issues for Cochlear Implant Users*. Specific topics discussed included perception of musical intervals, various forms of music participation (solo and chamber musicians, music teachers, etc.), and music rehabilitation. Some of the presenters were researchers in the field, but Wendy Cheng stressed: “You do not need a degree in hearing science to understand the presentations; we were fortunate to find presenters willing to use layman terms”. Several of the other presenters and panelists were musicians (a guitarist, a saxophonist, a pianist/organist, a band director, a composer) who used cochlear implants. They all had

their own ways of describing their musical experiences—and inspiring others with hearing loss and implants to continue pursuing music.

## New Algorithm Helps Cochlear Implants Detect Music

Oct 2013 Science Codex  
Advancement allows patients to hear differences in pitch and timbre.

Researchers at the University of Washington in Seattle have developed an algorithm that can vastly improve the sound quality of existing implants. In a standard implant, an algorithm filters sounds into fixed low-, middle-, and high-frequency bands, and then information from each band is routed to electrodes that are connected directly to nerves in the cochlea. In the new, more dynamic algorithm, the filters are not fixed. Instead, the sound is analyzed in detail, taking into account even small changes and altering the way the information is relayed to the cochlea. The result is a much more robust perception of music. Music is characterized by attributes such as pitch and timbre. Pitch defines the melody notes of a song and the intonation of speech. Timbre is the difference in sound between instruments. It is the pitch and timbre the researchers were trying to improve. For the first time they greatly enhanced patients' ability to perceive musical instruments. The average implant user scores 45% on the timbre test, but the test subject who did the best in their experiment reached nearly 90% with the new algorithm. Next up is finding a way to replicate the complex algorithm on a processor small enough to fit into existing implants, which is probably a few years away. There is also still a vast amount of aural information the new algorithm misses; that's the next project.

## Childhood Music Lessons Have Neural Benefit Decades Later

November 2013

Researchers at Northwestern University reported in the *Journal of Neuroscience* that receiving musical training during the early stages of growth had a positive outcome on the brain that lasted well into the last stages of life. During the ageing process, the brain loses its ability to respond fast to changing sounds, thus leading to hearing problems. Musical training can help overcome these cognitive declines in old age. Older adults who took music lessons as children but haven't actively played an instrument in decades have a faster brain response to a speech sound than individuals who never played an instrument.

“This study suggests the importance of music education for children today and for healthy aging decades from now,” said Principal investigator Dr Nina Kraus. The new study of 44 healthy adults, aged 55 to 76 involved measuring electrical activity in the auditory brainstem while listening to synthesised speech syllables. Brain response was faster among participants who reported taking music lessons in childhood between four and 14 years, though none had played for near 40 years, though none had played for near 40 years. Being a millisecond faster may not seem like much, but the brain is very sensitive to timing and a millisecond compounded over millions of neurons can make a real difference. “The fact that musical training in childhood affected the timing of the response to speech in older adults in our study is especially telling because neural timing is the first to go in the aging adult.” These findings confirm that the investments that we make in our brains early in life continue to pay dividends years later. The researchers also point out important consequences for education and social policy; they note that

music education is at high risk for being cut from US schools, which prioritize science, maths, and reading.

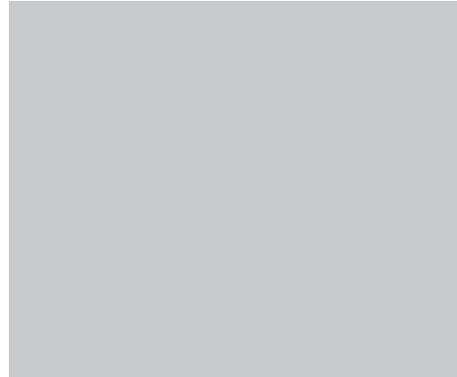
Other studies reach similar "Start Music Lessons Early" conclusions. One at Beijing University in China looked at the effects of music training on brain structure in 48 Han Chinese adults aged 19 to 21 years. All of them had had formal musical training for at least a year, beginning sometime between age 3 and 15. The brain regions related to hearing (superior temporal gyrus) and language (lingual gyrus) appeared to be larger in those who began taking music lessons before age 7. So musical training at a young age may change the brain's cortex, especially regions that influence language skills and executive function.

Still other studies presented at the 2013 annual meeting of the Neuroscience Society conclude that "Musical Training Influences Multiple Senses". A University of Montreal study suggested a broader role for musical training in improving the ability of the nervous system to integrate information from multiple senses. There were clear implications for the rehabilitation field. The overview press conference mentioned "intense musical training generates new processes within the brain, at different stages of life, and with a range of impacts on creativity, cognition, and learning."

(This parag can be omitted if necessary for space reasons) These recent findings have built on previous foundations. For example previous studies by Kraus and colleagues found that musicians can process noise faster than non-musicians plus solid evidence that lifelong musical experience has an impact on the aging process. A team of researchers from Concordia University found that musical training before age seven helped brain development. Children who started taking musical lessons early had better connections between the motor regions or parts of the brain that control movement of a person. Overall research evidence is strong for various cognitive benefits, such as better working memory, pitch discrimination performance, and selective attention. Furthermore, past studies have shown that music can help premature babies overcome their initial difficulties in sleeping, feeding and breathing and also help children diagnosed with ADHD concentrate. These past and recent insights point to potential new roles for musical training, including fostering brain plasticity, providing an alternative educational tool and treating learning disabilities.

## Deaf schoolboy given implants to learn violin

Dec 2013 [www.hearingtimes.co.uk](http://www.hearingtimes.co.uk)



Matt and Emma Denton, both professional musicians, discovered within hours of their son's birth that he could not hear properly. At one, Charlie was prescribed hearing aids. By the age of two and a half he was pronounced profoundly deaf. His parents – one half of the Carducci String Quartet – were shocked at the speed of his deterioration. "He was getting by on lip-reading," says his mother, "so we had no idea how bad things had got." Charlie's only hope was to have bilateral cochlear implants, which are designed for speech, not music. "On a website, we were shocked to hear how Gershwin's Rhapsody in Blue sounds through an implant: no audible notes, just crackling. But implants would give him the chance of age-appropriate speech, to go to a mainstream school, to chat with his friends. Waiting there, knowing they were drilling through Charlie's skull to receive the implants was horrific, says Emma, we were trying to read a score to distract ourselves." Charlie came through astonishingly and started to pick up new words for the first time. "It was fascinating to see him respond to sounds in a new way, the kettle was beeping at him. The cars in the street were so loud he had to hide. I cried when I realised I could talk to him in the car."

Then, surpassing their wildest expectations, he took up the violin, "like Daddy", and started piano lessons. But Emma was not satisfied with the explanation that Charlie's deafness was "just one of those things". While Googling his symptoms, including a severe reaction to sunlight, she came across Usher Syndrome, a rare and incurable genetic disorder that can lead to blindness as well. Just as they were about to go on stage to give a concert, the Dentons received a phone call confirming that Charlie indeed has Usher Type 1B, the most severe form

of the disease. He could be blind before he reaches adulthood. Having come through so much, you might expect the Dentons to be sucked into a quicksand of despair. Instead, they radiate reassurance. "Charlie is seven now, such a happy, lovely, fun boy. He is a real fighter and an inspiration to us all." He loves music. He has taken to his new ears brilliantly and has caught up at school. He thinks having implants is special. 'I don't have to listen to you Hoovering', he says, and flicks them off". He and his sister, Daisy, four, have a special way of communicating. They have developed their own little sign patterns. The Dentons' ability to remain positive does not diminish past or future anxieties but the sight of their son practising for his Grade One music exam with his small violin tucked under his chin is a spur not just to them but to everyone around him. Charlie is being taught the violin by Emma's mother, Caroline Lumsden, at the Gloucester Academy of Music, not too far from their home in the village of Cam. He is a natural showman, a performer. Matt's mother, Daphne, teaches him the piano. Incredibly, he knows when a musical phrase he has played is out of tune. "I have no idea what he hears," says Emma, "but when he plays something 'scratchy' he notices immediately."

## A Novel Case of Musical Hallucinations Aug 2013 *Frontiers of Neurology*

Two neurologists from Illinois report a unique case of musical hallucinations that they say raises "intriguing" questions regarding memory, forgetting, and access to lost memories. The 60-year-old woman, with a history of bilateral sensory-neural hearing loss and tinnitus, reported hearing music one night while trying to fall asleep. She said it was like a radio playing at the back of her head. Within 4 months, she was hearing music all the time. She would hear 1 song over and over for 3 weeks, than another song. What's novel about this case is that the songs she heard were popular tunes that her husband recognized when she sang or hummed them, but she herself could not identify them. "She could actually hum the tunes and retrieve the lyrics of non recognisable songs," the neurologists noted in an interview with Medscape Medical News. "That to us was unique."

### World-first Brain-imaging with entertainment

Oct 2013 Medical Xpress & stuff.co.nz

A new imaging device on Macquarie University's campus will help researchers in the ARC Centre of Excellence in Cognition and its Disorders (CCD) and the HEARING Cooperative Research Centre (CRC) better understand how the human brain processes information from a cochlear implant. The machine, called a cochlear implant magnetoencephalography (CI-MEG) processes brain function by measuring magnetic fields outside the head, overcoming the electromagnetic restrictions of cochlear implants. Professor Stephen Crain, Director of the CCD, says the MEG system opens fresh avenues for research into the effects of hearing loss and into restoration of hearing on brain development and function. "When we process information like language, neurons are firing and create tiny electric currents. Surrounding these electric currents are magnetic fields, which travel through the blood, tissue and skull and can be measured by the imaging machine."



BOXED IN: Jane Corless, who has a cochlear implant, being scanned by the new machine.

A child can lie in the machine and watch a movie or play a video game. "We know that early intervention yields the best cognitive outcomes for children, because brain plasticity is optimal in the first few years of life. Using the new MEG system, we plan to explore the effects of early intervention on auditory brain development in children with cochlear implants." The machine will also allow scientists to study language development in children, who struggle to perform language tasks that scientists use for adults. Now researchers can watch how children's brain respond to those tasks

Teacher Christine New working with her prep students Samuel Wainwright (6) and Amy Hyde (5) at Amberley State School at Yamanto.

### Teacher gains a "third ear" and overcomes hearing loss to remain with her students

Sept 2013 news.com.au

Faced with having to give up her lifelong passion Christine New was determined not to let her students down and find a way to continue teaching. With extreme hearing deterioration in both ears and troubled by intense ear infections, Ms New was unable to wear her hearing aids, making life and her job extremely difficult. With the help of a Bone Anchored Hearing Aid (Baha) and to the delight of her students, they were able to keep their favourite teacher in the classroom. Ms New said without the Baha her teaching was suffering. "It was really tough," she said. "I began to notice that even if I could hear a question in the classroom, I couldn't work out which child had asked the question. I have

been a teacher for 34 years and never had my own children ... I tried not to think about having to give up teaching." After several failed surgeries to fix her hearing, Ms New received a Baha in 2010. The 51-year-old said the 60 minute procedure changed her life more than she had imagined. "In class I can now hear better, I can hear where the voice is coming from and the sound is clearer; I explained it to the students and they call it my third ear." The Baha has not only allowed me to stay in my job, but also enjoy going out again and socialising. I can even enjoy listening to music now as well, something that was impossible before."

### Cochlear implants could help many troops, veterans

Oct 2013 NavyTimes.com

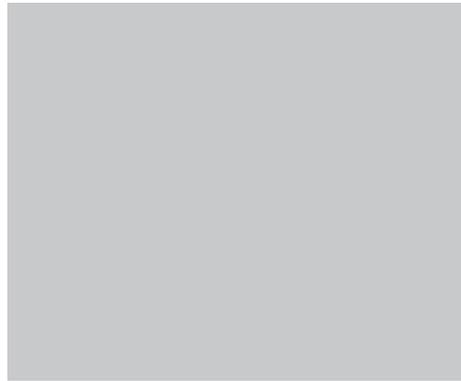
Marine Maj. Gen. Bob Hedelund, commander of the 2nd Marine Aircraft Wing, admitted that the podium at a conference on cochlear implants in Washington, D.C., was an odd place for him to be. Not one Marine has received an implant while on active duty, and only 39 troops in the other services have received one, according to his own research. But as a service member with significant hearing loss, and with the blessing of a Marine commandant who wears a hearing aid, Hedelund was there to advocate for the Defence Department to play a bigger role in research and treatment. "Marines are serving today with prosthetic legs and arms, and yet we haven't opened the door on the cochlear implant for somebody who has been rendered deaf, either due to loud noise or prolonged exposure". Hearing loss and tinnitus are the most common service-

profound hearing loss, implants are an option. The Marine Corps began tracking hearing loss in 2009, and now requires annual tests for all members. Army, Navy and Air Force members in certain units or positions, including those that routinely expose them to loud noises, are required to get tested annually. All services now require troops working in noisy environments to wear ear protection. But even pricey earplugs or headsets aren't foolproof. "Despite the fact that I have worn double hearing protection in my role as a helicopter pilot, I've had tinnitus for 10 years and my baseline [hearing] has shifted three times," Hedelund said.

The key to improving quality of life for troops as they age and hearing worsens could lie in the technology of cochlear implants. It helps having professionals in this field see that the military is interested

### Cochlear program to give deaf children best start to life

Sept 2013 Herald Sun



Deaf children as young as four months old will be able to hear sooner, through a new Melbourne-designed system of programming cochlear implants. The sooner a deaf child receives a hearing aid or cochlear implant, the bigger gains they make in speech and listening. The Bionics Institute's Professor Colette McKay has been lured back to Australia as a senior Veski innovation fellow to continue developing the system that measures the response in the brain to sound. The \$200,000 award over three years will ensure her new bionic hearing technology is developed on home soil.

Prof McKay has spent the past nine years leading the audiology and deafness research group at Manchester University and she worked with cochlear implant inventor Professor Graeme Clark on the original device. Her system uses the electrodes already in the implant to measure the response to sound in the hearing part of the brain, rather than in the hearing nerve. Clinicians will then be able to determine the exact settings for each implant and automatically program them. This new predictive technology will allow deaf children like six-year-old twins Ben and Lochie Baulch (pictured) who received cochlear implants at eight and 10 months of age, to start hearing sooner. 'To get a reliable hearing test for a kid that age is really hard, said mum Naomi. They can't say; 'I can hear that', or drop a marble. You have to spend three weeks training them to turn their head to look at a picture. To test if you're hurting them with sound, you have to look for a blink, an intake of breath or body language to know if you need to knock back the volume. Ben would never have spoken without the implant. He heard nothing at all. But now

they both speak beautifully, they read, they play music like normal little boys.'

### Computer models of neuronal sound processing in the brain lead to cochlear implant improvements

Dec 2013 Ear / Nose / Throat

Since our ears are located a few centimeters apart, sound waves from a given source generally reach one ear before the other. The difference is only a few millionths of a second, but that is enough for the brain to localize the sound source. Modern microprocessors can react sufficiently fast, but a nerve impulse takes around one hundred times longer. To achieve a perfect interplay, new strategies need to be developed. The perception of sound information begins in the inner ear. There, hair cells translate the mechanical vibrations into action potentials, the language of nerve cells. Neural circuitry in the brain stem transmits the signals to the auditory cortex, where around 100 million nerve cells are responsible for creating our perception of sound. Unfortunately, this "coding" is still poorly understood by science. "Getting implants to operate more precisely will require strategies that are better geared to the information processing of the neuronal circuits in the brain. The prerequisite for this is a better understanding of the auditory system," explains Professor Werner Hemmert, director of the Department for Bio-Inspired Information Processing, at the TUM Institute of Medical Engineering (IMETUM). Based on physiological measurements of neurons, his group built a computer model of acoustic coding in the inner ear and the neuronal information processing by the brain stem. This model will allow the researchers to further develop coding strategies and test them in experiments on people with normal hearing, as well as people carrying implants. For manufacturers of cochlear implants collaborating with the TUM researchers, these models are very beneficial evaluation tools. Preliminary testing at the computer translates into enormous time and cost savings. "Many ideas can now be tested significantly faster. Then only the most promising processes need to be evaluated in cumbersome patient trials," says Hemmert.

The new models thus have the potential to significantly reduce development cycles, so that patients will benefit from better devices sooner.

### CapTel phone



Many of you would be aware that through the initiative and support of the Australian Communication Exchange, Australia has undergone a trial program of using CapTel Phones. This has proven very successful and the phone is now available. You need a standard telephone line PLUS an internet connection. To get one go online and Register at [www.accesscomm.com.au](http://www.accesscomm.com.au).

### Nano-medicine to treat hard-to-reach deafness

Nov 2013 Herald Sun

Melbourne researchers are creating tiny particles to deliver drugs to the hard-to-reach inner ear, aiming to create the first preventive treatment for progressive deafness and increase the life span of cochlear implants. The particles can be loaded with medication to protect hair cells in the inner ear. These hair cells change the vibrations in the environment into electrical signals that are sent to the brain to be processed as sounds. When they are damaged (through noise exposure, medication, chemotherapy or old age) this causes hearing loss. Bionics Institute senior research fellow, Dr Andrew Wise told the international Medical Bionics conference at Phillip Island that drugs delivery through nanoparticles was emerging as a promising treatment to improve the hearing of cochlear implant patients. "Doctors are hesitant to provide an implant

*Technology talk continued overleaf.*

to people with some hearing because of the fear they'll lose what little they have. There is real interest from the major cochlear implant companies to improve the performance of these devices and enable a lot more people to get a cochlear implant." Dr Wise said the nanoparticles created were porous like volcanic rock, allowing the drugs to be deeply embedded and diffuse into a specific area of the body over a number of months. Afterwards the structure breaks down and is cleared by the body, so you don't need repeated drug delivery, which has significant side effects.

## Hearing Through Sight: Brain Plasticity and Why Cochlear Implants Work Better for Some People Than Others

Nov 2013 Science Daily

Activating the visual regions of the brain has proved essential to the best recovery of hearing, according to a new study by the Centre de Recherche Cerveau et Cognition of the Université Toulouse (CERCO), carried out in close collaboration with the ENT department at Hôpital Purpan. The findings published in *Brain* illustrate the crucial role of brain plasticity and may make it possible to develop diagnostic tools for specific rehabilitation. On average, people who, after becoming deaf, could only recognize one in five words before implantation are able to distinguish more than 80% of words afterwards. However, individual performance is very variable. What is the origin of this disparity? The signal delivered by the implant is significantly degraded, thus obliging patients to develop adaptive strategies. Their performance will therefore depend on how their brain adapts in order to decode the signal. The CERCO study involved patients who had

become deaf in adulthood after language acquisition, and who had recently received an implant. The scientists performed a PET (positron emission tomography) brain imaging session immediately after insertion of the implant: they then recorded the level of activation in each region of the brain during a simple test (which involved identifying whether the "sound" perceived was a word or not). Six months later, the research team measured the degree of recovery using more elaborate word recognition tests. The final stage was a correlation diagram for each brain region under study. Notable were the visual cortex and prefrontal cortex, which are associated with language, learning and production. The brain regions processing visual information were clearly correlated to auditory rehabilitation. The stronger the activation in patients' visual cortex at the time of implantation, the better they could understand speech six months later. This outcome was linked to the fundamental role of lip reading in auditory speech recovery. Vision supplies additional information that is crucial to understanding language, particularly in noisy environments. Sight and hearing act together and in synergy, thus helping to gradually improve patients' ability to decipher the words coded by the implant. These results also highlight the crucial role of brain plasticity in implanted patients. Based on objective brain imaging data, it may be possible to implement individual, more or less intensive speech therapy rehabilitation.

## CU researchers may have discovered a plan to disable Meniere's disease

Dec 2013 University of Colorado Denver News and Science Codes

Researchers at University of Colorado School of Medicine may have figured out what causes Meniere's disease and how to attack it. According to Carol Foster, MD, from the department of otolaryngology and Robert Breeze, MD, a neurosurgeon, there is a strong association between Meniere's disease and conditions involving temporary low blood flow in the brain. Meniere's affects approximately 3 to 5 million people in the United States. It is a disabling disorder resulting in repeated violent attacks of

dizziness, ringing in the ear and hearing loss that can last for hours and can ultimately cause permanent deafness in the affected ear. Up until now, the cause of the attacks has been unknown, with no theory fully explaining the many symptoms and signs of the disorder. "If our hypothesis is confirmed, treatment of vascular risk factors may allow control of symptoms and result in a decreased need for surgeries that destroy the balance function in order to control the spell" said Foster. "If attacks are controlled, the previously inevitable progression to severe hearing loss may be preventable in some cases." Foster suggests that Meniere's attacks can be caused by a combination of two factors: the malformation of the inner ear due to endolymphatic hydrops (the inner ear dilated with fluid) together with risk factors for vascular disease in the brain, such as migraine, sleep apnoea, smoking and atherosclerosis.

The researchers propose that a fluid buildup in part of the inner ear (strongly associated with Meniere's attacks) suggests a pressure-regulation problem that acts to cause mild, intermittent decreases of blood flow within the ear. When this is combined with vascular diseases that also lower blood flow to the brain and ear, sudden loss of blood flow similar to transient ischemic attacks (or mini strokes) in the brain can be generated in the inner ear sensory tissues. In young people who have hydrops without vascular disorders, no attacks occur because blood flow continues in spite of these fluctuations. However, in people with vascular diseases, these fluctuations are sufficient to rob the ear of blood flow and the associated nutrients. When the tissues that sense hearing and motion are starved of blood, they stop sending signals to the brain, which sets off the vertigo, tinnitus and hearing loss in the disorder.

Restoration of blood flow does not resolve the problem. Scientists believe it triggers a damaging after-effect called the ischemia-reperfusion pathway in the excitable tissues of the ear that silences the ear for several hours, resulting in the prolonged severe vertigo and hearing loss that is characteristic of Meniere's. Although most of the tissues recover, each spell results in small areas of damage that over time results in permanent loss of both hearing and balance function in the ear. This new theory, if proven, would provide many new avenues of treatment.